

**THE DROUGHT AND HEAT IN THE VICINITY OF ST. LOUIS, MO., DURING THE SUMMER OF 1913.**

By MONTROSE W. HAYES, District Forecaster.

By far the hottest and driest summer in St. Louis was the one of 1901. In that year the mean temperature for the period extending from June 1 to August 31 was 82.7°. The five summers that follow, in point of heat, are as follows: 1913, 80.7°; 1881, 80.6°; 1887, 80°; 1874, 79.3°; and 1899, 79.1°.

The dry weather in 1901 did not begin until June 10. There had been some copious showers just before that date, but beginning with the 10th and stretching into October there was a period of phenomenal drought. In the 113 days from June 10 to September 30, inclusive, the total precipitation was 3.25 inches. There were only 14 days with 0.01 inch or more of rain, and there were four protracted periods in which there was not a measurable amount of rain, one of 11 days, 2 of 17 days each, and 1 of 29 days.

The summer of 1881 was notably hot and dry, and a comparison of its mean temperature and total precipitation with similar elements for the summer of 1913 indicates that the two seasons were almost alike. However, there was one marked difference that must have had a material effect upon the growth and development of vegetation. In 1881 the dry, hot weather was not pronounced until in July, and that month and August were excessively droughty. In 1913 the rainfall was very deficient after the heavy precipitation of the first 10 days of April; then the July and August rainfall of this year, which the records show not to have been especially light in St. Louis, was phenomenally local. Sudden and heavy showers in the city in several cases amounted to mere sprinkles in the suburbs and surrounding country, where moisture was most needed. It is quite evident, therefore, that the early beginning of the 1913 drought must have affected crop growth more harmfully than the drought of 1881, which really did not begin until July. And it is probable that some crops were in 1913 injured to a greater extent than in 1901, as in the latter year the drought did not begin until June 10. However, the much hotter weather in 1901 may have overcome the advantage that the rains of the earlier part of the season would seem to have given.

The temperatures were not as high in 1913 as in 1901 and in 1881, but there was a long stretch of hot weather, beginning the 1st of June and continuing throughout the summer, except for a few short periods of relief. Neither in 1901 nor in 1881 did the weather become hot as early in the season as it did in 1913. From June 1 to August 31 there were, in 1901, 39 days with a maximum above 95°; in 1881 there were 33 days; and in 1913 there were 25 days. The highest temperature in 1901 was 107°, which is the absolute maximum for the station; in 1881 it was 105°; and in 1913 it was 102°.

In the vicinity of St. Louis vegetables and fruits, except the very early ones, gave a reduced, and in many instances an inferior yield. Some wells failed, and some of the coal mines across the river had to haul water or shut down.

Popularly, the summer of 1913 is considered the hottest and driest since 1901, which established a record for excessive heat and deficient precipitation, and judging it solely by its effects upon the crops and the water supply it very likely was.

There is inclosed herewith a copy of the August report of the secretary of the Missouri State Board of Agriculture, which may be of interest.

MISSOURI CROP REPORT.

COLUMBIA, Mo., September 6, 1913.

August was an unfavorable month for Missouri farmers, yet there will be neither want nor famine. In the face of discouragements, made all the more noticeable because of the failure of the early season promise of a bumper crop, there prevails an optimism and determination most commendable. This feeling is reflected in most of the reports from correspondents, notwithstanding that in every county of the State there was a falling off in crop conditions during August. At Columbia the rainfall for the month was but 0.77 of an inch, as compared with 4.91 inches last year, 1.86 inches in 1911, 1.67 inches in 1901, and 3.04 inches as normal for August. The highest temperature recorded was 105° on the 7th but on 11 days during the month it was 100° or more.

**Corn.**—Reports from the 114 counties of the State place the condition of corn at 41.8, a loss of 29 points for the month. One year ago it was 86.8, and the total State yield for that year was 243,000,000 bushels. Condition of corn on September 1, as reported by crop division sections, shows: Northeast, 43; northwest, 45; central, 41; southwest, 34; southeast, 46. Even in the northwest section, where heat and drought did comparatively little damage earlier in the season, the crop suffered greatly during August. There is much good corn in river bottoms and on low land. On the other hand there are upland fields that will hardly make good fodder. The crop is very poor in the counties south of the Missouri River and bordering on or near Kansas. Benton and the counties to the south have also been hard hit. North of the Missouri River the greatest lack of rain has been in Audrain and other northeast counties. It is estimated that 20 per cent of the corn crop of the State has been cut and that 40 per cent more will go into shock. More silos than ever before will also be filled.

**Wheat.**—Dry weather has greatly interfered with preparations for sowing wheat. Correspondents report only 30 per cent of the ground plowed. Estimates for the new crop place it at 89 per cent of the acreage harvested this year. Without rain soon this will be further reduced, but sufficient rainfall and a favorable fall for seeding might increase the acreage.

**Other crops.**—Additional information on the oat crop indicates a State yield of 20.5 bushels on that part of the crop thrashed. Yield of timothy seed will be very light and acreage only 41 per cent of normal. The clover-seed crop promises well, but it is too early to give figures. Yield of rye is placed at 14.2 bushels, buckwheat 10.3, barley 18, flax 6, but final figures may differ. Condition of cotton is 67, tobacco 52, and cowpeas 53.

**Live stock.**—Water for live stock is now the most serious matter with which the average farmer is having to contend, 88 per cent of the correspondents reporting a shortage. Ponds have dried up and many springs and wells that had never failed are dry or nearly so. Pastures are brown and bare, the condition for the State being 25. It is estimated that 30 per cent of the farmers are now feeding new corn. However, owing to a general shortage of live stock, there may be no extraordinary demand for feed. Number of hogs on feed as compared with one year ago is placed at 58 per cent; number of spring pigs on farms, 75 per cent; number of sows for fall farrow, 72 per cent; number of cattle on feed, 54 per cent; number of stock cattle on farms, 73 per cent. It is estimated that 24 per cent of the cattle have been disposed of owing to drought. No doubt, much of this was "star boarder" stuff that needed to go. With good prices prevailing and with intelligent weeding out there has been no sacrifice or loss from this source.

**A COMPARISON OF THE DROUGHT OF 1913 AND OTHER YEARS IN THE VICINITY OF SPRINGFIELD, MO.**

By JOHN S. HAZEN, Local Forecaster.

This place has a normal precipitation above the average for the eastern half of the United States, and has therefore been considered practically immune from serious droughts. The average precipitation for Springfield, computed for a period of 23 years preceding the past three dry years, is 44.50 inches, but the unprecedented drought of the consecutive years 1910, 1911, and 1912 have reduced the actual average to less than 43 inches for a 26-year period. Annual deficiencies during the past three years of 7.99, 7.77, and 11.38 inches, respectively, in addition to a deficiency of about 13 inches during the crop-growing season of 1913, makes a total de-

iciency of 40 inches, or practically the precipitation of one year since 1910. The unprecedented length of time, during which dry weather has continued, thus becomes a potent factor in the discussion of the present dry spell and has added largely to the severity of the crop losses.

This condition has resulted in the greatest scarcity of available water ever known in this usually well watered section. The James River, a stream which has an average flow of 1,500 cubic feet per second, is practically dry, and deep springs and wells, considered never failing, have gone dry. The available water supply of Springfield was so low that the use of water except for necessities was prohibited by order of the mayor of the city. Many farmers have been hauling water for two months, at serious loss and inconvenience, in order to keep their stock alive; and dust is so deep on country roads as to seriously impede traffic, especially by automobile. Pastures are burned up and little or no rough feed remains in the country. Farmers and dairymen are buying food for their stock, and milk and butter are selling at the usual midwinter prices. Thousands of trees have died and large numbers have been seriously injured, both the cultivated and wild. Many apple trees are shedding their buds, and the prospect for fruit next year is believed to be small. Nearly one-half the trees shed their leaves in August, and in many cases the leaves would shrivel and die in a day, as though the tree had been cut down or girdled. This condition apparently resulted from unusually low humidity during the latter portion of August, a reading of 14 per cent being reported from this station on the 30th. Complaints were made from all over the city of paper cracking and falling from the walls, and the increased danger from fires necessitated the establishment of patrols for the safety of the city.

The wheat crop is estimated as above the average, oats were poor, corn is from 33 to 40 per cent of the average, early potatoes were average, but late potatoes, gardens, hay, and forage crops as almost a total loss. The sowing of fall wheat has been delayed past the usual time, but many are sowing since rains.

All of the rainfall during the summer was of a local and restricted type, and in many cases good showers were reported as covering not more than 1 or 2 square miles. Springfield reported 1.75 inches on July 30, while 1 mile north and the same distance south no rain fell. As a result, occasional farms will be found with good crops, while perhaps adjoining farms have no crop, a condition more noticeable this year than ever before.

In 1901, 51 days with temperatures above 90° occurred during June, July, and August, as against 45 during the present season, and while the day temperatures were higher in 1901 than the present year, the excess in temperature during the growing season, April to August, was practically the same. August had an average temperature this year of 82°, the highest monthly August temperature ever reported at this station, and the highest monthly temperature ever reported here with the exception of July, 1901. The drought conditions were aggravated during the present year by an unusually large percentage of sunshine, excessively low humidity and vapor pressure, and with winds above the average.

Bankers in this place generally report collections as slow, and as likely to continue thus for a year or more. Much surplus stock has been disposed of on account of the scarcity of feed, but reports from among farmers do not indicate greater discouragement than in 1901, and high prices are being realized for all products.

Typhoid fever, hay fever, and asthma have been unusu-

ally prevalent during the present year, due it is believed to the low-water supply; at the same time there has been a marked decrease in the number of flies during the summer, as compared with previous years.

#### THE DROUGHT OF 1913 AT LINCOLN, NEBR.

By G. A. LOVELAND, Section Director.

The dry period of 1913 at Lincoln, Nebr., began on June 8 and continued until September 7. During this period of three months only 2.84 inches of rain fell, which is but 25 per cent of the normal. Only two showers occurred with sufficient rainfall to be beneficial to vegetation during this time, 0.62 inch on the 26 and 0.99 on the 28th of July. This is the smallest rainfall in 92 days at this time of the year ever recorded at Lincoln, Nebr. The years that most nearly approach this for small rainfall are 1881, 1886, and 1894, but in each of these years while the rainfall for July and August was small that for June and September was ample.

The temperature was high the last half of June and the first half of July, but the remarkably high temperatures of the hot period did not begin until July 13 and lasted until the 17th, 5 very hot days with maximum temperatures from 102° to 109°, then followed a week of moderate temperature after which the real heated period began. From July 26 to September 7 high temperatures continued almost without a break, only on four of the 44 days was the mean temperature below normal, and then but slightly. The maximum temperature was 100° or above on 23 of the 44 days, was below 95° on 11 days, and below 90° on 7 days.

The only hot period that compares with this occurred in 1901. This began June 23 and ended August 1. In these 40 days the maximum temperature was 100° or over on 25 days, was below 95° on 9 days and below 90° on 4 days. The mean temperature for the 40 days was 85.6° and for the hottest 44 days, June 21 to August 3, the mean temperature was 84.6°. For the 44 days, July 26 to September 7, 1913, the mean temperature was 83.5°.

For the period June 1 to September 7, 1913, the average temperature was 79.9°, the highest on record for the same period, although some of the individual months were not as high as in 1901.

The dry weather materially injured vegetation. There is no official estimate of the damage to crops obtainable, but the corn crop in this section will be exceedingly light, almost a failure, and all grass and forage crops are very light, except the first cutting of alfalfa. All fruit and garden vegetables were much injured. The water here is nearly all pumped from deep wells and was not affected.

#### THE HEAT AND DROUGHT OF 1913 AT OMAHA, NEBR.

By L. H. WELSH, Local Forecaster.

An examination of the records of this station shows that the present period of drought and heat has never been exceeded in intensity and duration, including at it does practically all of July, all of August, and the first week of September. While less precipitation than fell during July has been recorded in other months of the same name a few times in previous years, and the mean temperature has been equaled once and exceeded once, they were not coincident, and were followed by cooler and wetter weather during August than was the case this year.